AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) ~~Miniature~~ A miniature confocal optical head (4) for a confocal imaging system, ~~in particular~~ or for an endoscopic confocal imaging system, said head comprising:

- a point source (2b) producing an excitation beam;

- optical means (12, 13) capable~~, in particular,~~ of causing said optical beam to converge into an excitation point (S) situated in a subsurface plane (P) relative to the surface of a specimen, said plane being perpendicular to the optical axis (A) of the optical head; and

- means of scanning said excitation point so as to describe a field of view in said subsurface plane in two perpendicular scanning directions, rapid line scanning and slow column scanning,

~~characterized by~~ wherein mechanical micro-system means MEMs (14a-b) capable of moving in translation along a chosen displacement (Dc) at least one of the optical means (12, 13) which is mobile in a direction perpendicular to said optical axis (A) so as to obtain at least one of said scanning directions.

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2. (currently amended) ~~Optical~~ The optical head according to claim 1, ~~characterized in that~~ wherein the slow scanning corresponds to a frequency of approximately 10 to 15 Hz and the rapid scanning to a frequency of approximately 4 kHz, so as to produce an image in real time.

3. (currently amended) ~~Optical~~ The optical head according to claim 1, ~~characterized in that~~ wherein the MEMs means (14a-b) are capable of cooperating with the mobile optical means (12, 13) in a diametrically opposite manner and alternately.

4. (currently amended) ~~Optical~~ The optical head according to claim 1, ~~characterized in that~~ wherein the optical beam produced by the source (2b) is divergent, the optical means (12, 13) comprising successively first means (12) capable of transforming said divergent beam to a parallel or slightly divergent beam and second optical means (13) capable of forming the subsurface focusing point (S).

5. (currently amended) ~~Optical~~ The optical head according to claim 4, ~~characterized in that~~ wherein the first optical means (12) is mobile, capable of carrying out optical beam slow column scanning.

6. (currently amended) ~~Optical~~ The optical head according to claim 1, ~~characterized in that~~ wherein two of the optical means (12, 13) are mobile, each capable of being moved in a direction perpendicular to the optical axis so that each defines a scanning direction.

7. (currently amended) ~~Optical~~ The optical head according to claim 1, ~~characterized in that~~ wherein the source (2b) is mobile, fixed to piezoelectric-type means (11) capable of moving the excitation beam emitted by said source with a displacement (D_L) chosen so as to define the second scanning direction.

8. (currently amended) ~~Optical~~ The optical head according to claim 7, ~~characterized in that~~ wherein the second scanning direction and the characteristics of the piezoelectric means (11) correspond to rapid line scanning.

9. (currently amended) ~~Optical~~ The optical head according to claim 8, ~~characterized in that~~ wherein the piezoelectric means comprise a bimorphic piezoelectric positioner (11) extending along according to the optical axis (A) of the head, said source (2b) being fixed on one of the faces of said positioner at the front end of the positioner facing the optical means (12, 13).

10. (currently amended) ~~Optical~~ The optical head according to claim 1, ~~characterized in that it~~ wherein the optical head comprises means for modifying the depth of the subsurface observation plane (P) in the specimen.

11. (currently amended) ~~Optical~~ The optical head according to claim 10, ~~characterized in that~~ wherein the means for modifying the depth of the subsurface observation plane (P) in the specimen comprise micro-mechanical means MEMs (16a-b) capable of moving certain optical means (13) along the optical axis of the optical head.

12. (currently amended) ~~Optical~~ The optical head according to claim 11, ~~characterized in that~~ wherein the MEM means (16a-b) are capable of moving the second optical focusing means (13) in order to carry out the movement (Z) along the optical axis of the optical beam.

13. (currently amended) ~~Optical~~ The optical head according to claim 10, ~~characterized in that~~ wherein the means for modifying the depth of the subsurface observation plane (P) comprise means for modifying the radius of curvature of one of the optical means.

14. (currently amended) ~~Optical~~ The optical head according to claim 1, ~~characterized in that it~~ <u>wherein the</u> <u>optical head</u> comprises the terminal part of an optical fibre (2b) capable of guiding the excitation signal from an external source, the emergent beam from the fibre constituting the point source.

15. (currently amended) ~~Optical~~ The optical head according to claim 14, ~~characterized in that~~ <u>wherein</u> the optical fibre is single-mode with a core diameter allowing spatial filtering of the return signal and therefore ensuring the confocality of the head, the optical fibre having as large a numerical aperture as possible.

16. (currently amended) ~~Optical~~ The optical head according to claim 1, ~~characterized in that~~ <u>wherein</u> the source is of VCSEL type, having a numerical aperture and a cavity outlet diameter compatible with a confocal system, and associated with a detector placed behind the cavity of the VCSEL.

17. (currently amended) ~~Optical~~ The optical head according to claim 1, ~~characterized in that it~~ <u>wherein the</u> <u>optical head</u> comprises a tight window (17) at the outlet of the optical head intended to come into contact with the specimen and in order to carry out an index matching.

18. (currently amended) ~~Optical~~ The optical head according to claim 17, ~~characterized in that~~ wherein the window has a refractive power function on the focused optical beam.

19. (currently amended) ~~Optical~~ The optical head according to claim 1, ~~characterized in that~~ wherein the optical means (12, 13) have a numerical aperture at least equal to the numerical aperture of the source.

20. (currently amended) ~~Confocal~~ A confocal imaging system comprising:

- a focusing confocal optical head (4) with integrated beam scanning;

- a source (1, 2a, 2b) capable of emitting an excitation beam;

- means (5) of detecting an emitted signal;

- electronic and data processing means for controlling and processing the emitted signal (6-9) capable of reconstructing a confocal image of an imaged field,

~~characterized in that~~ wherein the optical head (4) is according to ~~one of the preceding claims~~ claim 1.

21. (currently amended) ~~System~~ The system according to claim 20, ~~characterized by~~ wherein an optical fibre (2a) linked to a laser source (1) and coupling means (3) for coupling said

fibre (2a) to the optical fibre (2b) for conveying to and from the optical head (4) and a fibre (2c) for conveying the emitted signal to the detection means.

22. (currently amended) ~~System~~ The system according to claim 20, ~~characterized in that~~ wherein the optical head comprising a VCSEL source and an integral detector, the system comprises flexible linking means between the optical head and the signal processing means.